### TOWARDS THE STANDARDIZATION OF MOLTEN SALT LOOPS' INSTRUMENTATION AND COMPONENTS

**TESIS test facility (Thermal Energy Storage in Molten Salts)** 

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#### **TESIS:com subplant:**

- Test and qualification of molten salt components for research and industry
- Investigation of unwanted operating events with molten salts (e.g. freezing processes)

#### **TESIS:store subplant:**

- Demonstration of a single-tank thermocline storage system with filler materials
- Large component testing



The TESIS test facility in Cologne, Germany



# **TESIS:com specifications:**

**TESIS** test facility

- Solar salt (60% NaNO3 and 40% KNO3)
- 290 °C 560 °C inlet temperature
- 0.5 kg/s 8.0 kg/s mass flow rate
- Mass flow and temperature ramps/shocks
- Required measurement and control equipment available on site
- Components installed in TESIS:com's test section

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#### **TESIS:store specifications:**

- Similar specifications to TESIS:com
- Main research goal: Investigation of single-tank thermocline storage systems
- Expansion for large-component testing planned for 2024
- 60 bar pressurized air cycle will be available as a heat sink





#### **Examples of component tests #1**

#### Flanges



 Temperature ramps and shocks

#### Valves



 Open/Close cycles at variable temperature and flow

#### Flow meters



 Mass flow variation at different temperatures





#### **Examples of component tests #2**

#### **Electric heaters**





- Two electric heaters with 360  $kW_{el}$  each
- Test campaign with one heater successfully completed
  - 3 month of testing
  - Permanent exposition to molten salt at 500 – 560 °C
  - > 5000 On/Off cycles

#### **Examples of component tests #3**

#### Salt-Air heat exchanger

- Component required for Malta's Pumped Thermal Energy Storage Concept
- Component tests conducted within the Store2REPower project



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